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Motivations

- Increasing wildfire activity across western continental US
 - 1 Jan – 11 Dec 2020: over 13.7 million acres burned nationally
 - Record-breaking wildfire episodes in multiple western states
- Large investment by western utilities to strengthen real-time monitoring of environmental conditions leading to extreme fire weather
- Collection and dissemination of surface-based observations with minimal latency critical for real-time monitoring:
 - Pre-fire conditions, utility system shutdown scenarios
 - Active fire monitoring, spotting potential, etc.
 - Post-fire/burn scar concerns (flooding, landslides, etc.)

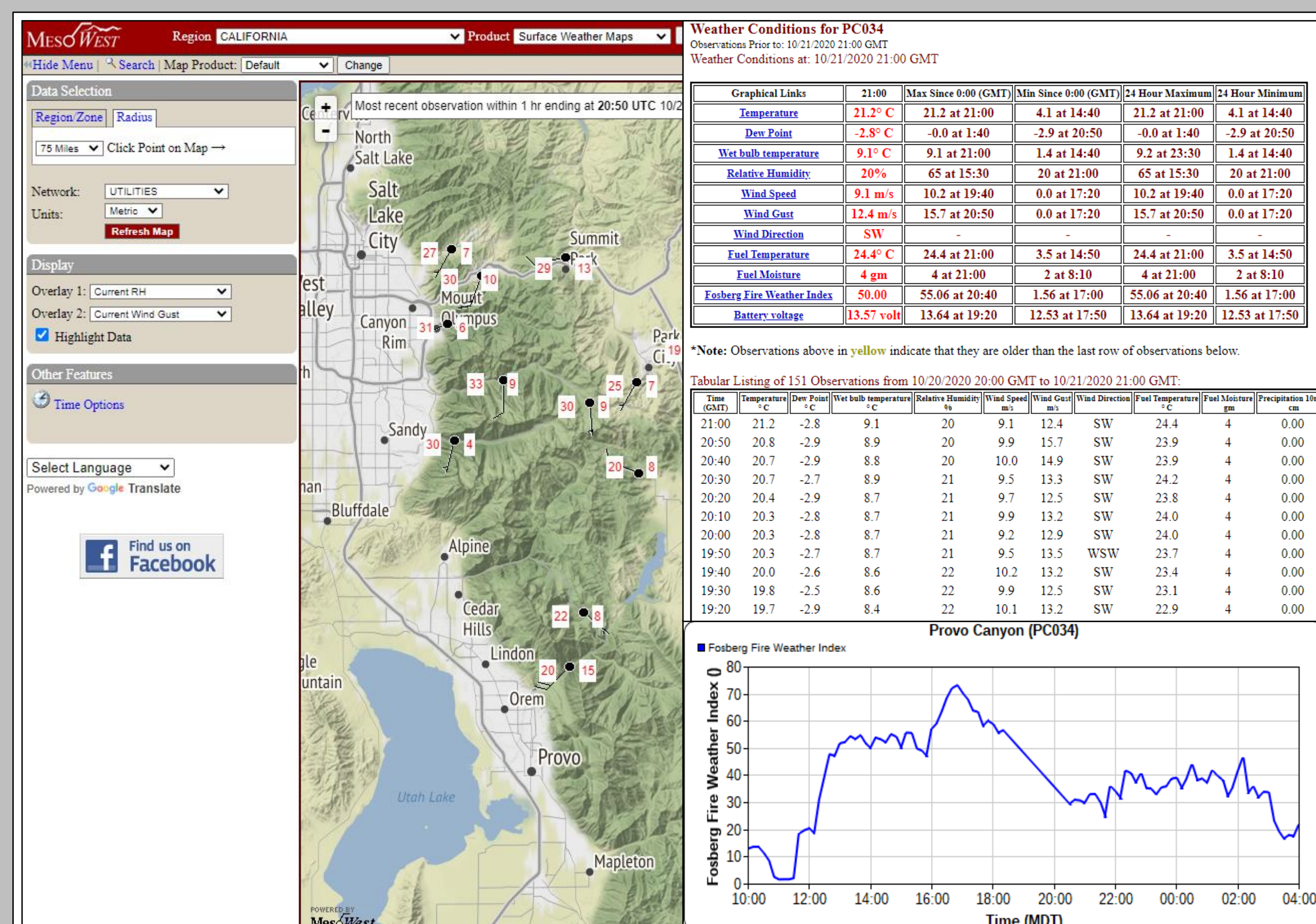
Data Access and Visualization Resources

Synoptic Data PBC (<https://synopticdata.com/>)

- Operational support systems for collection and dissemination of real-time and historical surface weather observations from contributing partners
- Primary subcontractor for NOAA National Mesonet Program
 - Real-time distribution of mesonet data to NOAA systems (e.g., MADIS)
 - Fast addition and development of data feeds from new resources
- Partners with providers who provide data in public and proprietary domains
- Management and rapid updating of station and sensor-level metadata (critical for platforms deployed in vicinity of active wildfires)
- Automated Data/Metadata Dissemination Services
 - Mesonet API (<https://developers.synopticdata.com/mesonet/>)
 - Enterprise Push Streaming Service

MesoWest (<https://mesowest.utah.edu/>)

- Cooperative project started in the mid 1990s between the University of Utah, National Weather Service, and local mesonet partners
- Web-based tabular and graphical products which now utilize real-time data feeds provided by Synoptic Data PBC for public-access resources
 - Station-specific tabular and graphical interfaces
 - Interactive Map Displays for RAWS and utility-deployed platforms
 - Observation trend monitors for stations located in vicinity of active wildfire perimeters
- Region-specific projects and services focused on wildfire index calculations:
 - Great Lakes Fire and Fuels (<https://qlff.mesowest.org/>)
 - Alaska Fire and Fuels (<https://akff.mesowest.org/>)

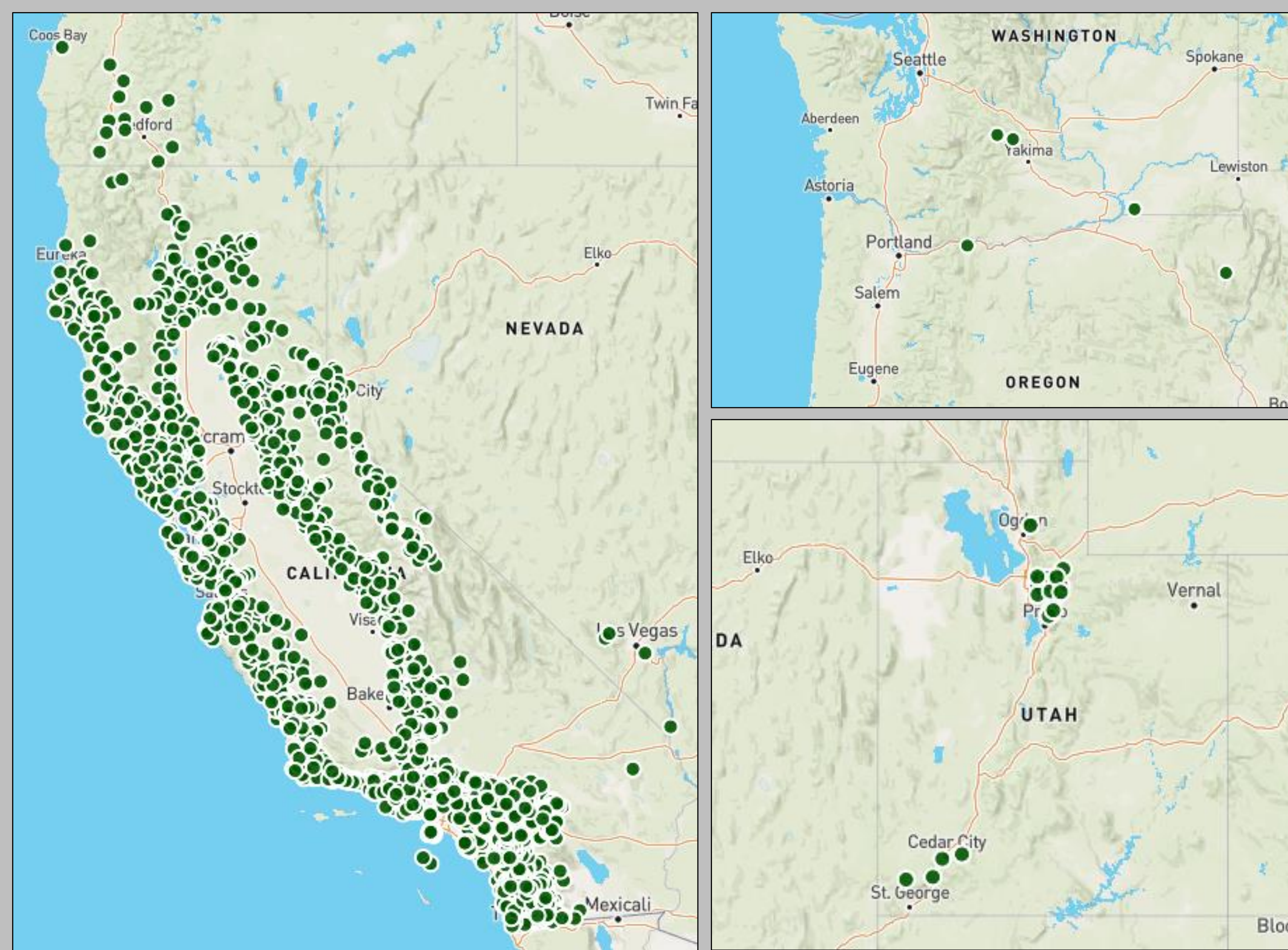


MesoWest displays of utility-operated weather stations located in northern Utah. (Left) A map of reported relative humidity, wind bars, and maximum wind speed (m s⁻¹). (Top right) tabular data display of Provo Canyon (PC034) collected observations. (Bottom right) graphical display of Fostberg Fire Weather Index (FFWI), which is provided as part of the data feed from the Provo Canyon site.

Utility-Supported Surface Weather Stations

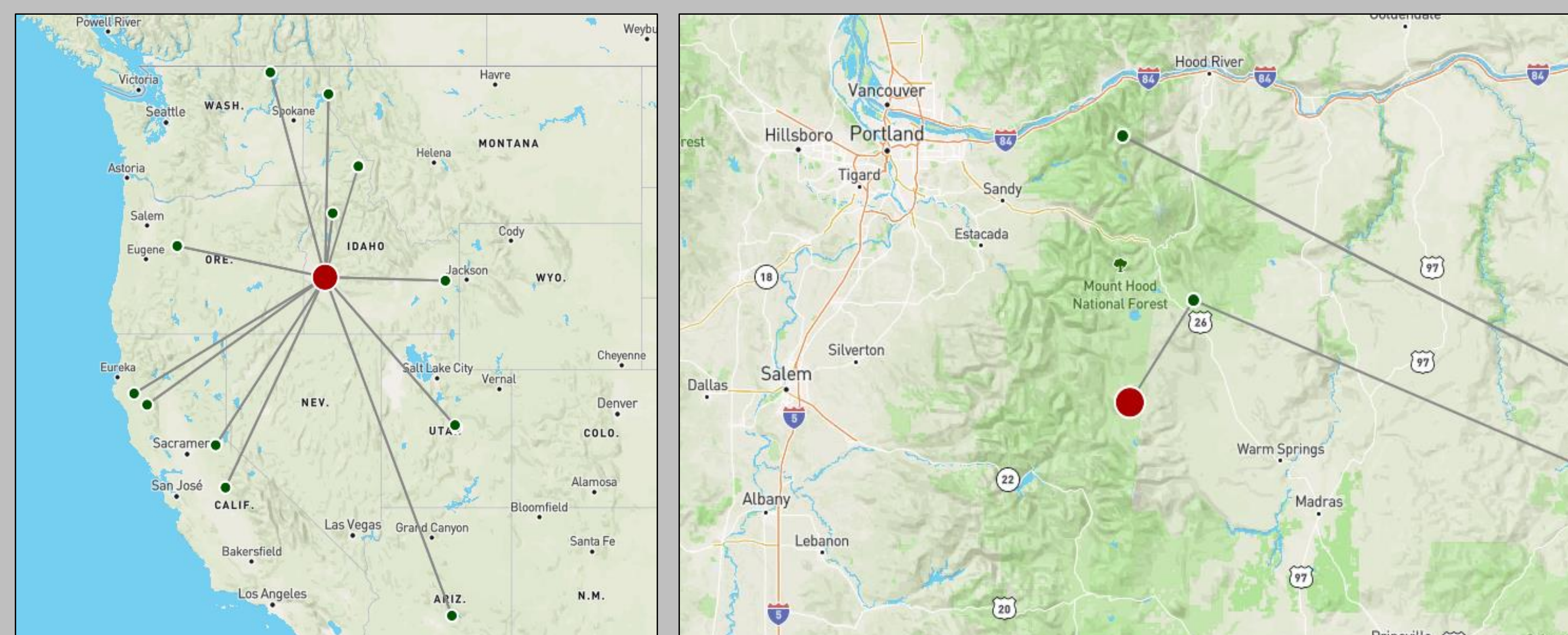
- Real-time weather station data for the utilities listed below are first collected and managed by [Western Weather Group, Inc.](https://www.westernweather.com/) and then distributed to Synoptic Data PBC

11 Dec 2020 - Summary of Reporting Weather Stations		
Entity	Reporting Platforms	Deployment Region
Liberty Utilities	29	Northern CA – Greater Tahoe Region
Nevada Energy	30	Nevada – Reno, Carson City, Las Vegas
PacifiCorp	44	Northern CA, OR, UT, WA
Pacific Gas and Electric	819	Northern and Central CA
San Diego Gas and Electric	212	Southern CA – Greater San Diego Region
Southern California Edison	860	Central and Southern CA



RAWS Weather Station Platforms

- Interagency Remote Automated Weather Stations (RAWS) are deployed across the United States in two primary configurations:
 - Long-term siting: standardized 20-ft platforms for multi-year data collection and assessment of fire danger conditions (typically transmit data hourly)
 - Incident: short-term deployments for active weather monitoring near wildfires, prescribed burns, or similar events (may transmit hourly or more frequently)



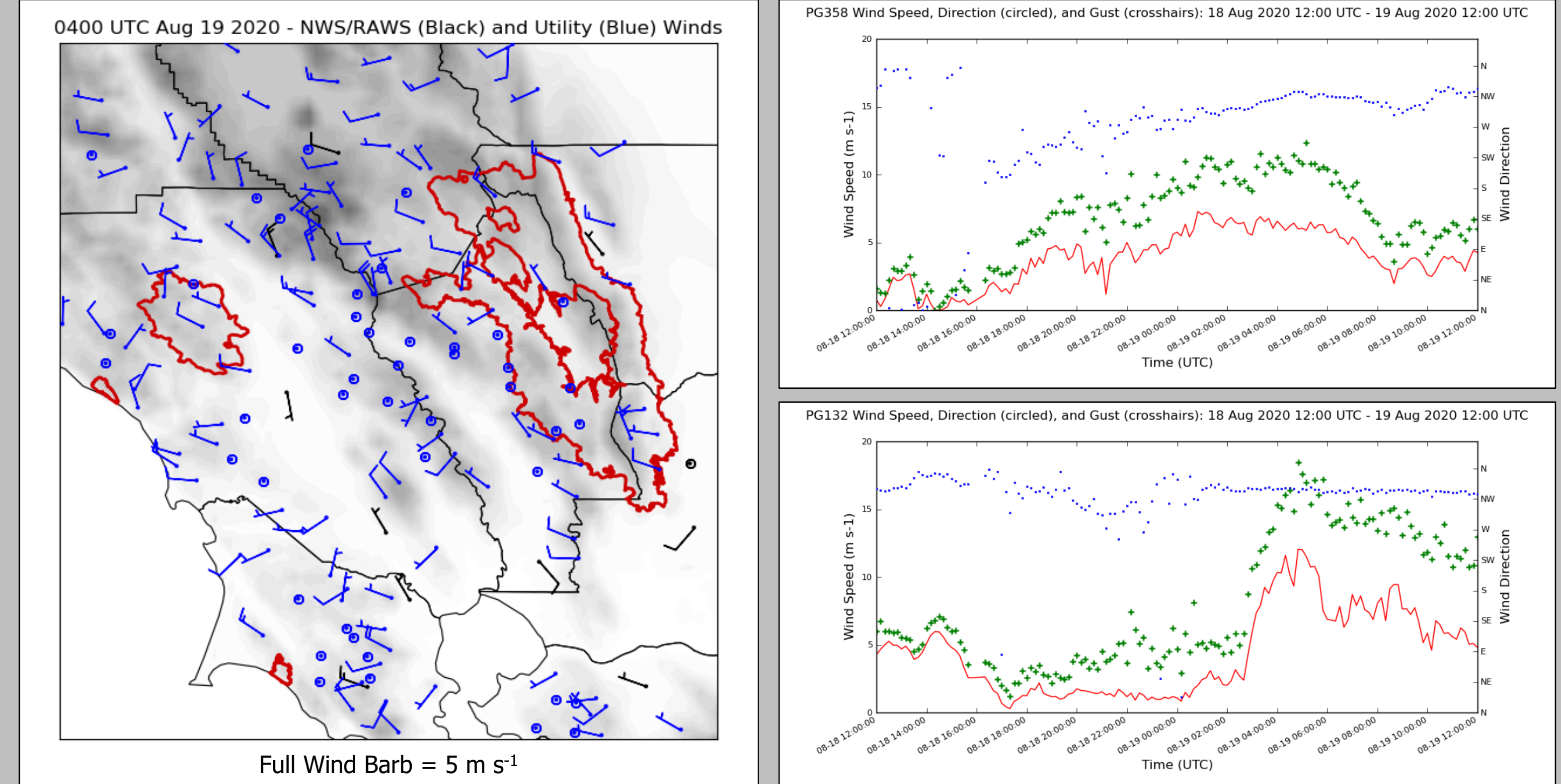
Multi-year deployment history of one incident RAWS station to many locations in the western United States

Short-term history of one incident RAWS station deployed in September 2020 to multiple spots near devastating wildfires in western Oregon

August 2020: Northern California Complex Fires

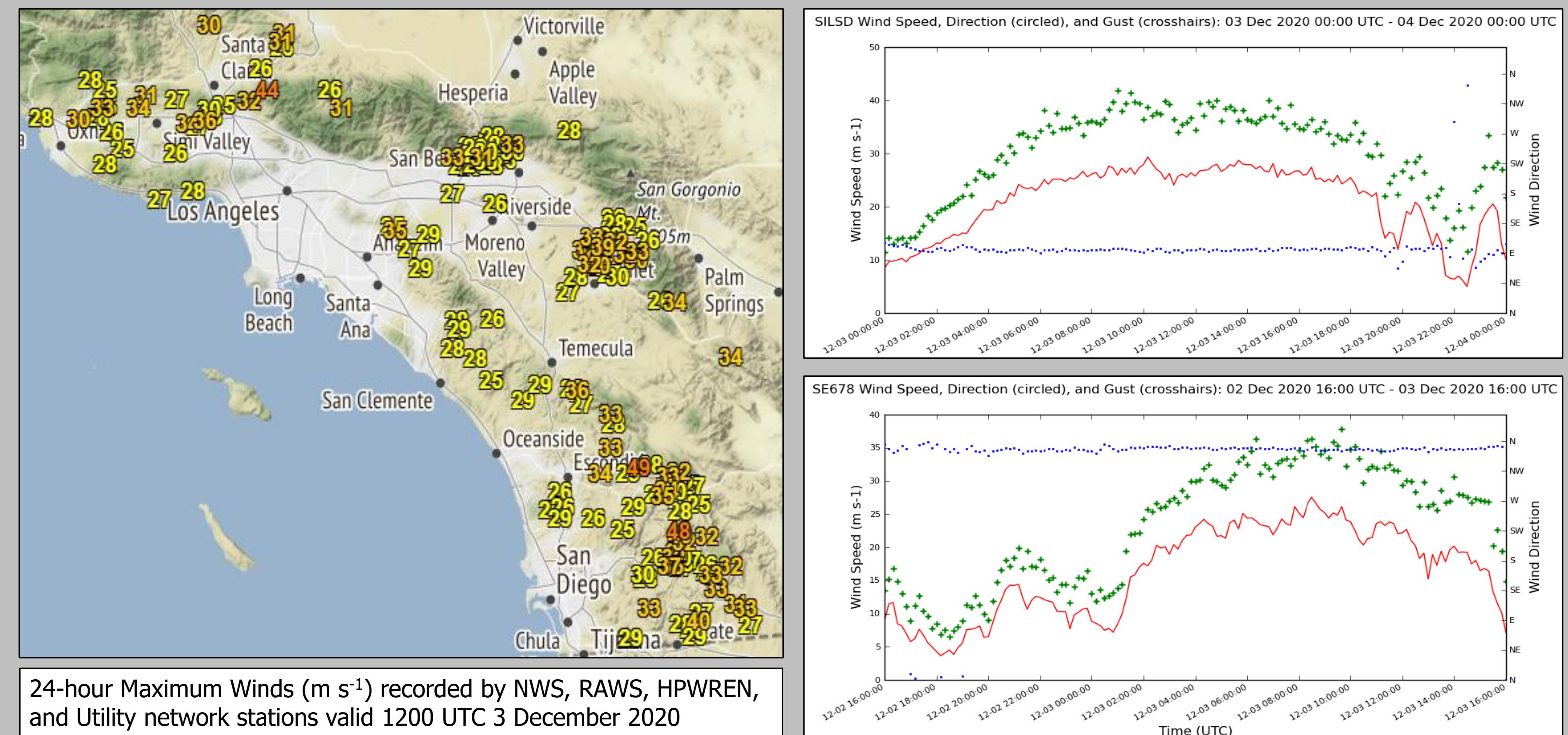
LNU Lightning Complex Fires (17 August - 2 October 2020)

- Primarily caused by merger of numerous lightning-initiated fires in northern CA
- Critical fire conditions 17-18 August led to rapid spread of the fires and evacuations
- 360,000+ acres burned, 1400+ structures lost, 6 deaths reported



2-3 Dec 2020: Santa Ana Winds

- Prolonged period of extremely strong northerly and easterly winds in southern CA
- Multiple wildfires resulted in evacuations and poor air quality across the region
- Utilities activated power system shutoff procedures to prevent potential ignition points



24-hour Maximum Winds (m s⁻¹) recorded by NWS, RAWs, HPWREN, and Utility network stations valid 1200 UTC 3 December 2020

Continued Support Initiatives

- Through the National Mesonet Program, Synoptic Data PBC will continue to support the real-time collection and dissemination of surface mesonet observations for use by the National Weather Service for the protection of life and property
- Synoptic Data PBC also will continue to support the collection and dissemination of real-time mesonet data for public consumption through MesoWest and other fire weather applications

Acknowledgements

Contributions to this work include metadata exploration tools and data API services developed by Synoptic Data PBC. We thank Western Weather Group, Inc. for working directly with the utilities and providing the data to Synoptic Data PBC and MesoWest. We also thank the University of Utah Center for Higher Performance Computing (CHPC) for computing support of MesoWest.